

NOTICE

IF RECEIVING THIS IFB BY INTERNET, CALL (707) 543-3700 TO REGISTER AS A BIDDER. FAILURE TO REGISTER AS A BIDDER MAY RESULT IN YOUR FIRM NOT RECEIVING BID ADDENDUMS. FAILURE TO SUBMIT BID ADDENDUMS WITH BID MAY CAUSE YOUR BID TO BE CONSIDERED NON-RESPONSIVE.



**INVITATION FOR BID
08-08**

IRRIGATION PUMP STATION PACKAGE

Issue Date
February 1, 2008

Bids Due
(Bid Opening)

**February 19, 2008
at 2:00 p.m.**

To

**Jim Wright, Purchasing Agent
City of Santa Rosa – Purchasing
630 Third Street, 2nd Floor
Santa Rosa, CA 95404
707-543-3706 Voice
707-528-3624 Fax**

**INVITATION FOR BID
08-08****Irrigation Pump Station Package**

Sealed Bids, signed and in the original only, subject to the Invitation for Bids, Provisions and Specifications,, will be received at the **Purchasing Office at 630 Third Street, 2nd Floor, Santa Rosa, CA 95404 until 2:00 p.m., on February 19, 2008**, for furnishing the pump station described in the schedule below in compliance with the terms, conditions and specifications contained herein.

NOTE: New Location – Please allow plenty of time to find parking, no bids will be allowed after 2:00p.m.

If you have any questions concerning this bid or the requirements, please call City Purchasing Agent, Jim Wright at 707-543-3706.

| <u>BID ITEM</u> | <u>QTY</u> | <u>DESCRIPTION</u> | <u>PRICE</u> |
|----------------------------|-------------------|--|---------------------|
| 1. | 1ea | Irrigation pump station package per specifications provided within, including installation and startup services, and the 2 nd identical variable frequency drive. | \$_____ |
| | | 8% Tax | \$_____ |
| | | Delivery | \$_____ |
| | | Total for Bid Item 1. | \$_____ |

BID

In compliance with the above, the undersigned offers and agrees, if this Quotation is accepted, within ninety (90) calendar days from date of opening, to furnish any or all of the items upon which prices are offered at the price set opposite each item, delivered at the designated point(s) within the time specified in the Schedule. Discounts will be allowed for prompt payment as follows:

_____ percent, 20 calendar days; _____ percent, 30 calendar days.

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| Name and Address of Bidder: Phone No.: _____ | Signature of Person Authorized to Sign: _____ |
| Date of Bid: _____ | Please Type Signer's Name and Title: _____ |

DELIVERY INFORMATION

Delivery of the Irrigation pump station package shall be complete, and the delivery date is **CRITICAL** and shall be not later than **60 calendar days after receipt of purchase order (see page 23 for additional information)**. The Bidder shall be required to state the availability in the space below:

Bid Item 1: _____ calendar days after receipt of purchase order.
Unit to be delivered complete.

Complete Irrigation pump station package shall be delivered to the following location:

**City of Santa Rosa
Municipal Services Center North
55 Stony Point Road
Santa Rosa, CA 95401
Attn: Associate Civil Engineer Tracy Duenas
707-543-3952**

**BID ITEM AVAILABLE FOR OTHER AGENCY:
"PIGGY-BACK" PROCUREMENT: YES ____ NO ____.**

NOTE: Prospective sellers are referred to GENERAL PROVISIONS for terms and conditions of OTHER AGENCY "PIGGY-BACK" PROCUREMENTS.

Irrigation Pump Station Package

Technical Specification

Bidder Compliance

| Yes | No | Part 1 – General |
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| _____ | _____ | <p>1.00 General. The bid must include a single source responsibility for the manufacture, warranty, service, start up and testing of a prefabricated, skid mounted, fully automatic variable speed pumping system package for irrigation of turf grass playing fields and landscaping at A Place to Play athletic field complex in Santa Rosa, California. The Irrigation Pump Station Package bid shall include an integrated dual pump pumping system with a pressure maintenance pump, disk filtration system and pumped fertigation system, complete as specified herein.</p> <p>The pumping system shall automatically maintain a constant discharge pressure regardless of varying flow demands within the station rating. The proposed systems shall conform to the following specifications in all respects. This specification covers the minimum requirements; however, it should not be construed as all inclusive. It is the successful vendor's responsibility to include all necessary appurtenances to provide for complete, automatic, smooth operating, and reliable pumping, filtration and fertigation systems. The manufacturer shall supply a complete set of general arrangement drawings, electrical power schematics, and control schematics for review and approval. Approved drawings shall be included in the operations & service manual supplied with the equipment. The Irrigation Pump Station Package shall be U.L. Listed as a Packaged Pumping System.</p> <p>The proposed Irrigation Pump Station Package shall conform to the space limitations for installation access and layout within the new building as shown in the attached Skid Limit Exhibit.</p> |
| _____ | _____ | <p>1.10 Manufacturer. The pump station package shall be manufactured by FLOWTRONEX PSI Inc. of Dallas, Texas, U.S.A.; WATERTRONICS of Hartland, Wisconsin, U.S.A.; or SyncroFlo of Norcross, Georgia, U.S.A. No Substitutions will be accepted. Each bid shall include the following:</p> <ol style="list-style-type: none"> 1. A complete specification for the pump station package proposed. 2. A general arrangement drawing showing overall dimensions and all piping layouts. 3. Complete submittal data for all major equipment (pumps, motors, filter, fertigation system and tank, flow meter, variable frequency drive (VFD), programmable controllers (PLC), valves, and motor starters). 4. An electrical schematic showing power wiring. 5. Evidence of at least five years of experience building irrigation pump stations of comparable size with programmable controllers and variable frequency drives. 6. Location of closest VFD factory trained service centers. 7. Manufacturer's electrical control panel U.L. file number. 8. Manufacturer's complete pump station U.L. file number. 9. A copy of all programming code, logic and documentation, all panel detail, all I/O listings, shipping field installation detail and arrangement. |

| Yes | No | Part 2 – Skid and Piping |
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| — | — | 2.00 Scope. Pump station shall be a completely skid mounted vertical turbine VFD pump station built by a single manufacturer. All equipment including but not limited to pumps, motors, piping, valves, instrumentation and controls shall be mounted on a common structural steel base to form a complete operating pumping station. |
| — | — | 2.10 Station Base or Skid. The pump station base shall be designed and fabricated to provide proper structural support for all attached equipment. The base shall supply sufficient rigidity to withstand the stresses of reasonable and competent transportation to site, off loading, installation, and operation. Main structural members shall be constructed from heavy weight channel or I-beam steel. Provisions shall be made in the station base for off-loading and handling the station at the site of installation. Base shall include 3/16 inch checkered deck plate or similar non-slip surfacing and 1 inch steel plate mounted under pump discharge heads. All 3/16 inch deck plate and 1 inch steel plate shall be 100% seal welded to main structural members. The maximum allowable deflection on the skid assembly shall be 0.1 inch per linear foot. Skip welding is not acceptable. The skid shall completely cover the wet well and shall include an integral, framed access hatch measuring 24 inches by 30 inches or as large as can be accommodated. Wet well access hatch shall be both hinged and removable and shall be made of aluminum. Dielectric isolation gasket shall be provided between dissimilar materials. The skid shall include cut-outs suitable for installation of wet well level sensing equipment by others. |
| — | — | 2.15 Paint. All metal surfaces of the pump station package except for those made of aluminum or stainless steel including but not limited to the skid, manifolds, valves, clamps, supports, pumps, piping, electrical enclosures and tanks shall be properly cleaned and coated with a multipart coating system have a total dry film thickness of not less than 5 mils. The coating systems shall meet or exceed the following testing criteria: direct impact resistance of 140 in/lbs (per ASTM D 2794), taber abrasion loss no greater than 60.2 mg (per ASTM D 4060), adhesion to substrate of 1500 PSI (per ASTM D 4541), and salt fog resistance at 1400 hours (ASTM B117-85) to the following standards: rust rating of 10 (D 610), corrosion rating of 4 (D 1654), and blistering rating of 10 (D 714). Manufacturer shall provide a touch up kit for owners use. |
| — | — | 2.20 Discharge Piping. All piping shall be constructed from ASTM A105 schedule 40 pipe or heavier as required to maintain a 3 to 1 pressure safety factor (including 1/16 inch corrosion allowance). All piping shall be hydrostatically tested to 150% of maximum shutoff pressure. Piping shall be painted as specified in Section 2.15. |
| — | — | 2.30 Bolts. All bolts used in the assembly of the pumping system shall be zinc plated to retard corrosion. Anti-corrosion or stainless steel washers shall be used on each side of fastener. |
| Yes | No | Part 3 – Pumps |
| — | — | 3.00 General. All main pumps shall be of the same pump manufacturer. The pump station shall include two equally sized main vertical turbine pumps and one low flow pressure maintenance pump. The total flow requirement for two main pumps running (design flow) is 1500 gpm. The |

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| | | <p>minimum head (design pressure) requirement at design flow immediately downstream of the disk filters is 85 psi. The pump station shall be designed to produce flows from 5 to 1500 gpm. Flows in the range of 5 to 80 gpm may be delivered at a minimum of 55 psi at the discharge of the filtration system, while all flows above 80 gpm must be available at 85 psi. Since the head loss through the disk filters will vary between backwash cycles, the total output immediately downstream of the disk filters may vary plus or minus 100 gpm from the design flow.</p> <p>The pumps will be installed in an existing wet well with an internal diameter of 6 feet. The minimum water surface in the wet well shall be 11.5 feet below the top of the wet well and the finished floor of the pump station. The pump intakes shall be set at 15.5 feet below the finished floor. The complete pump station package will be housed inside a concrete block building, to be provided by others.</p> |
| — | — | <p>3.10 Vertical Turbine Pumps. The main irrigation pumps shall be of the vertical turbine type with flow and head requirements defined above. Pump head shall increase continuously from maximum capacity to shutoff. Critical speed shall not be within 15 percent above or 25 percent below the speed range required by the pump to meet the specified operating conditions. The efficiency of the pumping units shall be as high as correct design and good engineering will permit; however, in no case shall the efficiency be such that the motor loading exceeds the motor horsepower rating at any point from zero discharge to free discharge. Pumps shall be Goulds or equal.</p> <p>The vertical turbine pumps shall be manufactured according to the standards of the Hydraulic Institute and to ANSI specification B58.1. The bowl assembly, column pipe, line-shaft, head shaft, and discharge head shall be of U.S. manufacture. The pumping systems manufacturer shall have a network of service centers which shall have available spare parts and trained pump technicians to handle service, repair and warranty procedures.</p> |
| — | — | <p>3.1.1 Discharge Head. The discharge head shall be of the fabricated steel type with a minimum 60,000 PSI tensile strength. The discharge shall have a working pressure of not less than 275 PSI and incorporate a 150 lb. ANSI discharge flange. A high pressure stuffing box shall include a drain which will be piped back to the wet well. Discharge head to be designed to include leakless configuration. Discharge head shall incorporate an integral air separation chamber, allowing air to be discharged through an air release line mounted on top of head.</p> <p>The head shaft shall be of the two-piece type, 416 stainless steel and shall be turned and ground. The pump manufacturer shall include a method for adjusting the impeller running clearance at the top of the head shaft. Adequate space shall exist to couple the head shaft and the line shaft above the stuffing box. Coupling shall be extra heavy duty AISI 416 SS with a minimum service factor of 2 to 1.</p> |
| — | — | <p>3.1.2 Column Pipe. Column pipe should be A53, Grade B schedule 40 material, in inter-changeable sections not more than 10 feet in length. Pump line shaft shall be AISI 416 SS. The size of the shaft shall be no less than determined by ANSI specification B58.1, Section 4.2, Table 4. Bearing retainers shall be bronze with rubber bearings.</p> |

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| — | — | <p>3.1.3 Pump Wet End. The pump bowls shall be ASTM A48 Class 30 cast iron free of detrimental defects. All bowls larger than 8 inch shall be of the flanged type construction. All pump bowls shall have porcelain enamel lined water passageways for high efficiencies.</p> <p>The impellers shall be C83800 bronze and of the enclosed type design. Pump shaft shall be AISI 416 SS turned and ground. The shaft shall be supported by bronze bearings above and below each impeller. The suction bell bearing shall be extra long and permanently greased packed and sealed with a bronze sand collar.</p> <p>A stainless steel clip-on type inlet strainer shall be shipped loose for field installation on the bottom of each pump at the owner's option. Inlet area shall not be less than 4 times the suction bell inlet area.</p> |
| — | — | <p>3.1.4 Motor. Motors shall be NEMA Premium energy efficient and of the vertical hollow shaft high thrust design. Motor shall have a WP-I enclosure, 1.15 service factor for across the line starting, and class F insulation. Design pump brake horsepower shall not exceed 98% of motor horsepower exclusive of service factor. The motor shall have encapsulated windings.</p> <p>Motor shall be rated for continuous duty and be designed to carry the maximum thrust load of the pump and will have B10 bearing life of no less than 5 years. Motors shall be rated and tagged for VFD service, proper ambient temperature and proper altitude per motor manufacturer's recommendations. Motors shall be as manufactured by U.S. Electric, Baldor, Reliance or equal.</p> |
| — | — | <p>3.20 Pressure Maintenance Pump. A pressure maintenance pump shall be provided to maintain system pressure during non-irrigation periods and to provide for small non-irrigation flow demands. The pump shall be of the submersible type with stainless steel housing and stainless steel impeller. Pressure maintenance pump shall be as manufactured by Goulds or equal. Pump shall be sized to prevent main pump cycling.</p> <p>Motor for pressure maintenance pump shall be a stainless steel submersible type with a 1.15 service factor. Motor shall be as manufactured by Franklin or equal.</p> |
| Yes | No | Part 4 – Valves, Gauges and Appurtenances |
| — | — | <p>4.00 Scope. Pump station manufacturer shall provide all valves, gages, fittings and appurtenances necessary for the proper operation of the pump station, including but not limited to the following.</p> |
| — | — | <p>4.10 Check Valves. Check valves shall be bolted directly to the pump discharge heads and sized to match the design flows, pressures and required function. They shall be of the silent operating type that begins to close as forward velocity diminishes and be fully closed at zero velocity preventing flow reversal. Valve bodies shall be cast from ASTM-126C cast-iron or better and shall be free from blow holes, sand holes, and other impurities. The valve design shall incorporate a center guided, spring loaded poppet, guided at opposite ends and having a short linear stroke that generates a flow area equal to the pipe diameter. Internals shall be machined bronze disc, seat, and stem guide. Seat shall be Buna-N to provide resilient sealing. Dual disc style check valves are not acceptable. Valves shall be sized to permit full pump capacity to discharge through them without exceeding a pressure drop of 2.5 PSI. Check valve</p> |

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| | | shall be as manufactured by Valmatic, Flomatic or equal. Valves 4 inch and smaller shall be pressure rated for 250 PSI, 6 inch to 10 inch shall be pressure rated to 150 PSI. Valves 12 inch and larger shall be globe style with 150 PSI rating. |
| — | — | <p>4.20 Discharge Isolation Valves. Discharge isolation valves shall be located adjacent to the pump discharge and immediately downstream of the filter. Discharge isolation valves shall be resilient seated butterfly valves that meet all applicable requirements of AWWA C504, Class 150B. Valve bodies shall be of ductile iron conforming to ASTM A536. All internal and external surfaces shall be coated with a polyamide-cured epoxy to a minimum thickness of 6 mils in accordance with AWWA C550.</p> <p>Butterfly valves shall be furnished with travelling nut type actuators that conform to AWWA C504. Actuators shall be self-locking, capable of holding the valve in an intermediate position between fully closed and fully open without creeping to fluttering regardless of flow conditions. Actuators shall have built-in stop limiting devices to prevent over travel of the disc. Valves shall close with a clockwise rotation. Actuators shall be factory lubricated utilizing a grease-packed construction, providing maintenance-free operation for the life of the valve.</p> <p>Valves 8 inch and smaller shall have a lever operator. Valves 10 inch and larger shall have a gear operator with hand wheel. Valves shall be rated at 200 PSI. Valves shall be Pratt Model 2F11, DeZurk AWWA or equal.</p> |
| — | — | <p>4.30 Pressure Relief Valve. A pilot operated modulating pressure relief valve shall be included and sized to match the design flows, pressures and operating parameters. The valve shall be set 10 to 14 PSI above operating pressure and will relieve when inlet pressure exceeds spring setting on pilot. Valve shall be quick opening and slow closing to minimize surging. Pressure relief valve shall not be used as integral part of normal irrigation pressure control. Discharge of relief valve shall be piped back to wet well. Valve body shall be ductile iron with 125 LB inlet and outlet flanges, and shall be rated for 250 PSI. A wye strainer shall be installed in the inlet side of the valve body to provide clean water to the CRL pilot. A butterfly valve shall be installed on the inlet of the relief valve. The pressure relief valve shall work hydraulically and shall not be operated or opened from any electrical external source or control. The relief valve shall work solely as a safety for over pressure relief and shall not function as a normal part of the station controls. Relief valve shall be as manufactured by CLA-VAL, Watts or equal.</p> |
| — | — | <p>4.50 Pressure Gauge. A pressure gauge shall be mounted on the discharge header with a ½ inch isolation ball valve. All gauges shall be glycerin silicon filled. Accuracy shall be within 2%. Gauge diameter shall be 3 ½ inch minimum. Range shall be at least 50% higher than the highest pressure attainable from the pumps at shutoff head conditions. Gauge shall have a stainless steel back and bronze internals. Pressure gauge shall be as manufactured by Wika, ENFM USA or equal.</p> |
| — | — | <p>4.60 Chemical Inject Port. Two ½ inch chemical injection ports shall be provided in the pump discharge piping between the pump and the filter. One shall be used to inject chlorine solution installed by others and one shall be plugged for future use. The ports shall consist of ½ inch female threads plugged by male threaded plugs.</p> |

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| — | — | 4.70 Air Release Valve. An air release valve shall be installed in the discharge header or piping. The air re-release valve shall be sized to operate according to the operation parameters of the pump station package. Discharge of air release valve shall be piped back to wet well. A manual valve shall be installed to isolate the air release valve. |
| Yes | No | Part 5 - Electrical |
| — | — | 5.00 Scope. To provide complete instrumentation and controls to automatically start, stop and modulate pump speed(s) to smoothly, efficiently and reliably pump variable flow rates at a constant discharge pressure. Full alarms and safety features needed to protect the equipment and irrigation piping system. All electrical controls shall be U.L. Listed as an Industrial Control Device. |
| — | — | <p>5.10 Control Enclosure. Controls shall be housed in a NEMA 4 enclosure with integral latches. The control enclosure should be constructed of 12 gauge steel and the back plate assembly shall be constructed of 12 gauge steel; 60 inch wide and larger to be 10 gauge or thicker. The enclosure shall be powder coat painted or as specified in the paint specification listed under Section 2.15. All enclosure cut-outs shall be done by laser for proper fit, sealing and coating retention. All indicating lights, reset buttons, speed potentiometer, selector switches and the operator interface device shall be mounted on enclosure door and shall be rated NEMA 4. All internal components shall be mounted and secured to the removable back plate assembly. A closed type cooling system shall be included to cool the enclosure and reject heat from the VFD. Open type cooling systems allowing outside ambient air to enter the panel are not acceptable. No water line connections shall be permitted inside of the control enclosure. VFD status and internal parameters must be viewable without the opening of the enclosure door.</p> <p>A label shall be provided on the enclosure to indicate arc flash hazard. Label data shall include flash hazard boundary, flash hazard incident energy at 18 inches, limited approach boundary, restricted approach boundary, and prohibited approach boundary.</p> |
| — | — | 5.20 Codes. The control panel with controls shall be built in accordance with N.E.C., and U.L. standards. The pump station, including electrical components and enclosure, shall be labeled as a complete U.L. listed assembly with manufacturer's U.L. label applied to the pump station. All equipment and wiring shall be mounted within the enclosure and labeled for proper identification. All adjustments and maintenance shall be able to be done from the front of the control enclosure. A complete wiring circuit and legend with all terminals, components, and wiring identification shall be provided. Main disconnect shall be interlocked with door. Cabinet shall be lockable. |
| — | — | 5.30 Surge Arrester. All electrical equipment shall be protected by a U.L. listed approved Category C and Category B surge arrester. The device under IEEE C62.41 Category C shall withstand an impulse of 10Kv/10Ka and under Category B shall withstand a ring wave of 6Kv/500a and an impulse of 6Kv/3Ka. Pass voltage for a 480v device to the end equipment shall not exceed 1500V-1800V when subjected to a 8ms - 20ms wave shape resulting in the following performance statistics: 3720 joules minimum with a power dissipation of 82,500,000VA at 1800V maximum pass voltage to the protected equipment. Response time shall be less than 5 nanoseconds. |

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| ___ | ___ | 5.40 Main Disconnect. A non-fusible main disconnect shall be provided to completely isolate all controls and motor starting equipment from incoming power. Main disconnect shall have a through the door operator. Disconnect shall be as manufactured by ABB, Allen-Bradley, GE, Cutler Hammer, Square D or equal. Disconnect shall not be rated as a service disconnect. |
| ___ | ___ | 5.50 Control Power. Power for the controls shall be provided by a control power transformer which will provide low voltage, single-phase power for the pumping system control operation. Control power transformer shall not be used for any other external load. |
| ___ | ___ | 5.60 Skid Conduit. All on skid conduit shall be flexible conduit with water tight connections at enclosure and termination device. All conduits shall be fastened to the skid every 24 inches. |
| ___ | ___ | 5.70 Junction Boxes. All off skid devices requiring control interface shall be terminated in a junction box. This junction box shall be located at the skid edge nearest the installation point of the off skid device. Fertigation and monitoring systems shall be terminated in a NEMA 4 junction box located on the top left side of the main controls enclosure to allow end user connection. |
| Yes | No | Part 6 – Station Controls |
| ___ | ___ | 6.00 Scope. To provide complete instrumentation and controls to automatically start, stop and modulate pump speeds to smoothly, efficiently and reliably pump variable flow rates at a constant discharge pressure. Full alarms and safety features needed to protect the equipment and irrigation piping system. All electrical controls shall be U.L. Listed as an Industrial Control Device. |
| ___ | ___ | 6.10 Motor Starting Equipment. All motor starters for the pumping station shall be mounted on a single back panel in a single NEMA 4 enclosure. Motor starters shall be U.L. Listed. Each main irrigation motor shall have dual contactors, which are both electrically and mechanically interlocked to allow the VFD to operate on both of the main irrigation motors. Motor overload relays shall be I.E.C. rated class 10 ambient compensated. Fuses shall supply short circuit protection to each motor and shall be rated for a minimum 200,000 amp interrupting capacity. Motor starters shall be as manufactured by Allen Bradley, Cutler Hammer or Square D or equal. Motor over-loads shall be manual reset only. Auto-reset of motor overloads shall not be permitted. The starter shall be provided with type 2 protection per UL 508. |
| ___ | ___ | 6.20 Variable Frequency Drive. The variable speed drive shall be designed for a constant torque motor. The variable speed drive shall be a digital, pulse width modulation (PWM) variable frequency drive (VFD) with IGBT transistors. The VFD shall include a 3% input line reactor to protect against voltage transients. The VFD shall have a minimum wire to wire efficiency of 98.5%, and shall be rated up to 550 volt operation in order to eliminate nuisance tripping at marginally high voltage conditions. Incoming power end shall be protected by fast acting semiconductor fuses. Any VFD error messages shall be displayed on a 80 character LCD readout in English. The following fault protection circuits shall be included: Overcurrent (240%), Overvoltage (130%), Undervoltage (65%), Overtemperature (70 Deg. C), Ground fault, and motor overload. The VFD shall be capable of starting into a rotating load and accelerate or |

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| | | <p>decelerate to setpoint without safety tripping. The VFD shall have an automatic extended power loss ride through circuit which will utilize the inertia of the pump to keep the drive powered. Minimum power loss ride-through shall be one cycle based on full load and no inertia. The VFD shall be optimized for a 3 kHz carrier frequency to reduce motor noise. The VFD shall employ three current limit circuits to provide "tripless" operation. The following operating information shall be displayed on the VFD LCD: KWH, elapsed time, output frequency (Hz), motor speed (RPM), motor current (amps), and voltage. Line reactor will be installed on input of VFD to protect against voltage transients. The VFD LCD display shall continuously scroll through all operating information and shutdown faults while the drive is running and while stopped. The information shall be viewable through a water tight plexiglas window on the control panel door. VFD shall be as manufactured by ABB or Siemens or equal.</p> <p>A second identical VFD shall be provided loose as a spare, delivered packaged in a shipping crate.</p> |
| — | — | <p>6.30 Pressure Transducer. Pressure transducer shall be utilized for providing all pressure signals for the control logic. Pressure transducer shall be a solid-state bonded strain gage type with an accuracy of plus/minus 0.20% and constructed of 316L stainless steel. Transducer shall be rated for station discharge pressure as shown on technical data sheet, and shall provide gauge pressure output, rather than an absolute. Pressure transducer shall be factory calibrated and tested. Pressure transducer constructed of plastic is not acceptable. Threshold transducers are not acceptable. Pressure transducer shall be as manufactured by GEMS, Rosemount or equal.</p> |
| — | — | <p>6.40 Flow Meter. The pump station package shall include an 8 inch electromagnetic flow sensor to be installed by others off-skid, which shall be utilized for control and to display the pump station flow rate, and total flow through the pump station controller operator interface device (OID). Flow meter shall be electromagnetic flow meter comprised of two major components: a primary head and a signal converter. Flow meter signal converter shall produce two separate signals, pulse and 4-20mA, in linear proportion to flow rate. Flow meter shall read flows from 0-40 fps, with a worst case inaccuracy of 0.5% of indicated value (not a percentage of full scale) at 1.3 fps or greater. Flows less than 1.3 fps shall have a lower accuracy with accuracy applying to indicated value (not full scale). Meter shall be installed according to manufacturer's recommendations. Flow meter shall be as manufactured by Krohne, Siemens, Badger or equal.</p> <p>1. Primary Head</p> <p>The flow tube shall be ANSI B16.5 class 150 flanged for sizes less than 24 inch and AWWA class D flanged for sizes above 24 inch with a 304SS spool. Wetted liner shall be hard rubber. Liner shall extend beyond the ends of the flow tube and over the flange faces. Liner shall remain stable and in place under a 500 mBar absolute vacuum or pressure situation. Liner shall be rated for the medium pumped. Magnetic coils shall be wound by the flow meter manufacturer and held in place in such a way as to prevent any fluctuation in the magnetic field generated. Magnetic coils in flow tubes 6 inches and smaller shall be epoxied together through a fusion bonding process, which renders the magnetic coil a single solid piece with no loose windings. Electrodes shall be from Hastelloy C4. They shall be inserted from the inside of the flow tube, and shall be sealed along their length. Electrodes sealed at one or more discrete points</p> |

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| | | <p>shall not be accepted. The wires connecting the electrodes to the primary head shall be fastened in place along their entire length to prevent the transmission of erroneous data or signal noise acquired through signal wire movement. All wiring shall be brought into the primary head connection box and terminated. The shroud protecting the coils and electrodes shall be welded in place, and internally pressure tested to 1.5 atmospheres with air pressure. On completion, the flow tube shall be finish painted on all outside metallic surfaces. Primary head shall be NEMA 6 rated.</p> <p>2. Signal Converter</p> <p>The signal converter shall be NEMA 4X rated, and shall house the microprocessor-based electronics required for magnet excitation and flow measurement. Functions and data requirements shall be set by either a PC or by a hand held programmer. Unit shall process flow using a bipolar pulsed DC signal. Power supply shall be 115/230VAC 48-64 Hz. Outputs shall be 4-20 mA and pulsed output scalable at 0-100Hz or 0-1000 Hz for full scale range. Signal converter shall also include a binary output to indicate direction of flow.</p> <p>3. Grounding rings</p> <p>Where magnetic flow meters are placed in a pipeline that insulates the water from ground (e.g. epoxy lined steel pipe or plastic) grounding rings are required at both ends of the flow meter to eliminate eddy currents that may exist within the medium being pumped. Grounding rings and flow meter body must be grounded properly, in accordance with manufacturers recommendations.</p> <p>4. Calibration and Testing:</p> <p>Meter shall be hydraulically calibrated on a testing device that is at least 10 times more accurate than the meter, and shall not be calibrated against a master meter. Each and every flow meter produced by the flow meter manufacturer shall be flow tested and hydraulically calibrated according to this procedure. Manufacturer's test and calibration equipment shall be internationally certified, and shall be re-certified every three years. Calibration shall be accomplished through direct volumetric comparison, on rigs certified as having a measurement error of equal to or less than 0.03% A calibration certificate shall be issued for each and every flow meter produced by the flow meter manufacturer. Calibration certificate shall be traceable to the US National Bureau of Standards. Meters shall be calibrated under standard conditions to a measurement error of less than 0.50% of rate.</p> |
| — | — | <p>6.50 Controls. All control logic shall be handled by an industrial grade programmable logic controller (PLC) with a 160 character LED industrial operator interface providing data entry and read-out capabilities. PLC shall provide demand controlled sequential pump start-up, shutdown and safety features through its pressure sensing, flow sensing and voltage sensing devices. PLC shall have LED indicators for input, output, and six diagnostic read-outs showing PC Run, CPU Fault, and two communications, (battery and force). An LED visual status light is provided for each I/O to indicate on/off status. PLC shall be provided with a built in EEPROM, capacitor, and battery for memory backup. <u>All</u> logic for system control, timing, and control of VFD speed shall be handled by the PLC. A separate set point controller is not acceptable. PLC shall have a built in clock calendar. The PLC shall be as manufactured by WAGO, Modicon, Siemens or equal.</p> <p>A minimum of 4 analog outputs and 16 digital outputs shall be provided for communication to radio telemetry equipment to be provided and installed by others.</p> |

Control software shall be parameter driven, fully documented, and allow user to easily change ALL operational parameters. Standard control features and equipment which need to be included as a minimum are as follows:

Alarms and shutdowns:

1. Low discharge pressure
2. High discharge pressure (Attempts restart)*
3. Low water level (Attempts restart)
4. Phase loss (Attempts restart)*
5. Low voltage (Attempts restart)*
6. Phase unbalance (Attempts restart)*
7. Phase reversal
8. Individual motor overload/phase loss (indicates which individual motor was shut down), Manual reset only. Automatic reset is not acceptable.
9. VFD fault (shutdown VFD pump only and attempts restart)*

* Three unsuccessful restarts in 60 minute period will give hard shutdown.

All alarms will be indicated by a red general alarm light. Specific alarm conditions along with procedures for correction will be displayed in English on the operator interface display (OID).

A. Panel face switches and lights: Controls shall be designed so operator can discretely start and stop all pumps in all modes of operation including manual mode, operator interface failure, VFD bypass and PLC bypass modes with enclosure doors closed and disconnect switch fully engaged. Enclosure shall include the following switches/ or indicator lights:

1. Individual pump run lights
2. Individual pump on/off switches
3. System Hand / Off / Automatic switch
4. Mode select switch – allows automatic bypass mode of operation which can be used in the even of VFD failure
5. VFD selector switch – in manual mode, allows user to select which pump will be run of the VFD
6. Reset – Acknowledges pump station alarms
7. Speed potentiometer – in manual mode allows user to adjust VFD pump speed
8. Low discharge pressure over-ride switch – disables low discharge pressure alarm

B. PLC bypass switch allows user to manually operate pumps should PLC fail. The bypass switch shall be din-rail mounted inside the enclosure. When in bypass the station shall be capable of running all pumps in the manual mode with door operator switches. Any excess flow and pressure shall be bypassed through the pump station relief valve

C. Six distinct set point pressures (normal, lockouts 1 & 2, and 3 high elevation). The lockout feature gives the user the flexibility to lower the set point pressure automatically at days and times, and "locking out" the operation of one or more of

main pumps if local power authority imposes penalties for operating these pumps during such times. It also allows user to set a maximum RPM for the VFD pump during these lockout times so that user can limit amperage draw during penalty periods. The high elevation set point can be tied into a computerized irrigation system, or directly linked to high elevation satellites. When high elevation satellites are operating, control software will automatically and gradually elevate the pressure to the new desired set point. When finished, the high set point will be lowered back to normal.

D. Software shall be included to automatically and gradually ramp up irrigation system pressure to the desired operating pressure (i.e., 1 PSI every 4 seconds) without overshooting design pressure. This feature operates whenever pressure drops below set point pressure. This ramp up time shall be fully adjustable by the operator. This control feature shall be based on an increase in pressure over a pre-defined time period. The acceleration control on the VFD is NOT an acceptable means of adjusting pressure ramp up speed.

E. Software shall be included for maintaining a lower irrigation system pressure when not irrigating. Controls shall cycle the PM pump at these reduced pressures during non irrigation times and pressure will gradually increase to design pressure when the irrigation periods begin.

F. Neither flow meter nor VFD output frequency shall be used for shutting down last VFD driven pump. Controls and software shall incorporate a method to eliminate excessive cycling of VFD pump at very low flow conditions, yet not run the pump excessively at no-flow conditions.

G. Automatic alternation of VFD driven pumps. This shall be accomplished by incorporating dual mechanically and electrically interlocked contactors allowing alternation of the VFD between pumps. The controls shall alternate pumps based on individual run time allowing each pump to acquire equal operation.

H. Real time clock calendar shall allow PLC to internally provide all date, time and day of week functions used above.

I. Two separately adjustable PID control loops for both low flow and high flow pressure stability.

J. User shall be able to field select either of two modes of VFD operation. Auto switch VFD option allows VFD to sequentially start each pump. The standard mode of operation starts the first main pump on the VFD and the remaining pumps start across the line as required.

K. Shutoff algorithm for fixed speed pumps to minimize pump cycling while also remaining responsive to sudden flow reductions. Minimum run timers alone for minimizing fixed speed pump cycling are not acceptable. Discharging through relief valve during pump transitions is not acceptable.

L. Full manual operation capability with panel face mounted speed potentiometer for manually adjusting VFD speed.

M. Light test sequence: Pressing the reset button for 5 seconds illuminates

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| | | <p>all lights.</p> <p>N. All pump station shutdowns shall be of the controlled type that sequentially retires pumps at user selectable intervals to reduce water hammer within the irrigation system. Phase fault shut-down shall have accelerated rate to minimize motor damage. All pump system shut downs shall be of a controlled type that sequentially retires pumps at intervals appropriate to the specific individual alarms.</p> <p>O. The pump station software program shall enable the set point pressure to be raised or lowered by the end user at the pump station. The pump station software ladder logic shall be written such that no other value requires changing if the set point pressure is adjusted. Pressure maintenance pump and main irrigation pump start pressures, the pressure maintenance pump stop pressure, low discharge shutdown and high discharge shutdown shall be at a differential pressure off of set point (i.e. pressure maintenance pump (PMP) to start 5 psi below set point and stop 5 psi above set point).</p> <p>P. The PLC code documentation and logic standards</p> <ol style="list-style-type: none"> 1) All logic shall be written in ladder format except where complex manipulation is required such as shifting masking or math functions. 2) All logic will be structured. Linear programs are to be avoided. Structure the logic into blocks of specific function and arrange those blocks in OB1 to a fashion that denotes system operational flow. 3) All passed parameters for Functions, Function Blocks, Organizational Blocks, and others will be given a plain text symbol and plain text description in the block header. Auto assignment of parameters is not acceptable. 4) All data in data blocks will have a plain text symbol and plain text description. Auto assignment of data members is not acceptable. 5) Each and every operand, block and variable table shall have a plain text symbol in the program assignment list and a plain text description in the program assignment list 6) Each rung of ladder will have a title and a plain text description of the logic operation contained in that rung. 7) All blocks will have a plain text description of the complete block function in the block header at the top of the block. 8) Each line of statement list will have a comment that describes the use of the line operand and its function in relation to the previous and next operand. 9) All scaling needs to be done in the PLC. All values passed to the SCADA system will need to be fixed point integers. Do not use floating-point numbers. Offset decimal places to get decimal values for example. A raw data value of 0-5000 will equal a SCADA data value of 0-500.0 in engineering units. 10) No password protection of programs is allowed. Not at the processor level or at the block level. The only acceptable block locking will be Siemens firmware, No proprietary code is acceptable all operational code will become the sole property of the City of Santa Rosa. |
| — | — | <p>6.60 Individual motor phase failure and low voltage safety circuitry shall retire any pump that experiences low voltage, phase failure or phase unbalance as monitored at the load-side of each pump motor contactor. Each pump motor shall have its individual protective device and time delay to allow for transient low voltage during motor starting to allow maximum motor protection. Separate main phase failure and low voltage safety circuit shall also be provided to retire the pumping system if it experiences low</p> |

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| | | <p>voltage, phase failure or phase reversal as monitored at line-side of control enclosure. Phase monitor shall have a time delay to allow for transient low voltage during motor starting and to allow maximum motor protection. Operator interface device (OID), mounted in enclosure door, shall signal phase failure for any affected pump. The individual pumps or pumping system shall not operate until the voltage problem has been corrected and safety has been manually reset. Single incoming phase monitor safety circuit is not acceptable.</p> |
| _____ | _____ | <p>6.70 Color Touchscreen Operator Interface Device (OID). The pump station shall include a NEMA 4, 320 x 240 minimum resolution, touchscreen display mounted on the control panel door. This device will allow the operator to view and selectively modify all registers in the PLC. The unit shall store its messages in non-volatile memory. The operator interface device shall incorporate password protection for protecting data integrity. The device will allow for display and modification of all timers, set points, lockout times, etc. The device shall communicate with the PLC through the programming port, and shall include an RS232 communications port allowing a printer to be attached for real time station status logging. In addition to the data entry keys, the following shall be included on the systems main menu.</p> <ol style="list-style-type: none"> 1. Pressure, Flow and System Status: The current pressure, flow, VFD RPM and a system status overview shall be displayed. Codes or Fault's ID numbers shall not be adequate. 2. Current Condition of all Alarms: The input state and alarm state, for all active alarms shall be shown. 3. Pump Runtime and Starts: Runtime and number of starts for each pump shall be readily available. The starts and runtime must be verified by electrical pump feedback. The OID will include a grand total and reset value for each pump. 4. Alarm History: The last nine alarms shall be stored in PLC Memory with detailed information about time, pressure and flow at the time of occurrence. The log will also include diagnostic and recommendations for correction of condition. 5. Total Flow Output: This total shall include a grand total since commission and a total since reset. 6. Stations Events: The last 255 events shall be stored in PLC memory. This will include all alarms, individual pump starts and stops, and change in system status. 7. The display shall provide detailed diagnostic information to the operator about the logical state which starts and stops irrigation pumps. This diagnostic information will provide direct insight to controller internal logic. 8. The pump station software program shall be user friendly enough to enable the set point pressure to be raised or lowered by the end user at the pump station. The pump station software ladder logic shall be written in such a way that no other value would require changing if the set point pressure had to be adjusted. Pressure maintenance pump and main irrigation pump start pressures, the pressure maintenance pump stop pressure, low discharge shutdown and high discharge shutdown shall not be at a specific value but a differential pressure off of set point (i.e. pressure maintenance pump (PMP) to start 5 psi below set point and stop 5 psi above set point). |
| _____ | _____ | <p>6.80 Operation. During non irrigation times (determined by the discrete run signal from the remote master irrigation controller provided by others), the pressure maintenance pump (PM) will cycle on and off as required to maintain irrigation system pressure. The start and stop pressures shall be a differential off of set point. The</p> |

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| | | <p>cycling pressures can be user selected and can be set substantially below normal set point pressure, if desired. If the PM pump cannot maintain the desired pressure, and the run signal from the remote master irrigation controller is received, then the VFD will start the first pump and will gradually ramp the pressure up to desired irrigation pressure. The start pressure of the VFD pump shall be a differential below the set point. The pump speed will be modulated to hold a constant discharge pressure regardless of flow. As the flow rate increases and the VFD pump can no longer maintain pressure while at maximum speed, the next sequential pump will be started and the VFD driven pump will accordingly reduce its speed and modulate. An algorithm shall be included for accurately reducing the VFD pump speed as the next sequential pump is started so that no pressure surges are generated during the transition (even with across the line starting). If the user prefers to switch the VFD from pump to pump for sequential starting, he can select this option with the OID. As the flow continues to increase, pumps will sequentially be started until both main pumps are running. As the flow begins to decrease, pumps will be sequentially turned off until only a single VFD driven pump is operating. When a no flow condition occurs, PLC must check and verify pump curve position prior to station shutdown. If the PM pump cannot maintain irrigation system pressure, and the master irrigation controller has not called for the main irrigation pumps to run, an irrigation system failure alarm shall be initiated.</p> |
| Yes | No | Part 7 – Installation and Startup |
| — | — | <p>7.00 General. Others shall be responsible for providing all materials, equipment, and labor necessary to install all items associated with the pump station. The manufacturer shall coordinate and cooperate with those designated by the owner to construct the pump station building and to make piping and electrical connections to the pump station package.</p> |
| — | — | <p>7.10 Unloading and Setting Supervision. Unloading of the pump station is the responsibility of the manufacturer, unless specifically called out elsewhere in the specification. Crane to off-load and set the pump station on the concrete slab shall be provided by others.</p> |
| — | — | <p>7.20 Start Up. When discharge piping, electrical connections, and electrical inspection have been completed, the pump station manufacturer shall be contacted for start up. A minimum one week notice shall be given to manufacturer prior to scheduled start up date. During start up, the complete pumping system shall be given a running test of normal start and stop, and fully loaded operating conditions. During this test, each pump shall demonstrate its ability to operate without undue vibration, or overheating and shall demonstrate its general fitness for service. All defects shall be corrected and adjustments made at the expense of the pump station manufacturer. Test shall be repeated until satisfactory results are obtained. Start up assistance will be provided for a minimum of three (3) 8-hour days included in the Irrigation Pump Station Package purchase with an option for the owner to extend for two (2) 8-hour days at no additional cost to owner.</p> <p>After the station startup has been completed, but before leaving the job site, a training session will be given. The training session will be given to the owner or the owner's representative to familiarize them with the pumping system operation, maintenance and adjustments. One (1) 8-hour day of on-site training after start up shall be provided if requested by the owner.</p> <p>On call telephone support shall be provided by the manufacturer within normal business</p> |

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| | | hours during the warranty period. At least two (2) 24-hour unscheduled support visits shall be provided as requested by the owner during the warranty period. Service technicians shall be available within 48 hours of request by the owner. |
| Yes | No | Part 8 – Warranty |
| — | — | <p>8.00 Warranty. The manufacturer shall warrant that the Irrigation Pump Station Package or component will be free of defects in workmanship for 18 months from date of authorized start-up.</p> <p>Provided that all installation and operation responsibilities have been properly performed, manufacturer will provide a replacement part or component and field installation within 48 hours of request during the warranty life. Upon request, manufacturer will provide advice for trouble shooting of a defect during the warranty period. Reasonable access must be provided to allow for repairs or replacement of any components.</p> <p>Manufacturer shall use only high quality material. As with any mechanical or electrical device, some preventative maintenance efforts are required to enhance service life. Because of varied conditions beyond the control of manufacturer, this warranty does not cover damage under the following condition or environment unless otherwise specified in writing:</p> <ol style="list-style-type: none"> 1. Misuse, abuse, or failure to conduct routine maintenance. 2. Handling any liquid other than irrigation water. 3. Exposure to electrolysis, erosion, or abrasion. 4. Presence of destructive gaseous or chemical solutions. 5. Over voltage or unprotected low voltage. 6. Unprotected electrical phase loss or phase reversal. 7. Acts of God |
| Yes | No | Part 9 – Additional Control Integrated Equipment |
| — | — | <p>9.00 Scope. Pump system manufacturer shall provide the following equipment and shall integrate the controls of those devices into the main control panel. If there are any discrepancies between this options section and the main specifications, this section takes precedence.</p> |
| — | — | <p>9.10 Fertigation System: General Description: Pump station manufacturer shall provide a nutrient injection system capable of independently injecting liquid fertilizer product(s) into the irrigation pump station discharge piping. The fertigation pump and appurtenances shall be installed separate from the pump station skid.</p> <p>The injection pump shall be controlled by a separate Variable Speed DC Drive, 1 horsepower or greater. The control panel and pump shall be mounted on a frame constructed of corrosion resistant, non-conductive; isophthalic polyester resin in fiberglass reinforced plastic (FRP). The electrical controls shall be mounted inside a corrosion-resistant NEMA 4X enclosure. The pumps and control panel shall not be mounted on the irrigation pump station skid. Installation shall be the responsibility of the irrigation pump station manufacturer including all control and power wiring and all piping, fittings and appurtenances necessary between the pump station skid and the fertigation pump. Nutrient injection system shall be manufactured by Flowtronex PSI Inc or equal.</p> |

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| | | <p>Nutrient injection pump shall be Milton Roy diaphragm metering pump, U.S. Filter Encore diaphragm metering pump, or equal. Pump capacity shall be 30 gallons per hour. Pump shall be of Alloy 20 construction. Pump shall be capable of delivering product from 0 GPH up to the designed maximum of 30 GPH at the station rated pressure. Pump to be independently driven via a DC Variable Speed Drive to accurately control injection rate. As part of the injection system the suction and discharge fittings shall be constructed of acid resistant glass reinforced polypropylene with PVC suction and discharge tubing.</p> <p>Controller Hardware Specifications:</p> <ol style="list-style-type: none"> 1. Full battery backed memory for program storage, product configuration information and control parameters. 2. RS232 port available for MODBUS™ communication over modem, wireless or wired connections. 3. Real Time Clock/Calendar. 4. Hardware for monitoring of water flow meter rate. 5. Analog inputs available for Chemical tank level monitoring <p>Controller Functional Capabilities:</p> <ol style="list-style-type: none"> 1. System shall be capable of injecting product proportional to the irrigation pump station flow rate. 2. Minimum of 16 separate injection control programs. 3. Each program shall control injection rate for one product in pounds per acre and offer product on/off, time of day, day of week and one of 9 digital command inputs (from irrigation satellite, switch, relay, etc.). 4. Display shall show actual and programmed injection rates for each pump during program execution. 5. Product pump shall be protected from loss of product flow. 6. Controls shall include a NEMA 4 two-line sixteen-character LCD operator interface providing data entry and read-out capabilities. All injection programs and applicable parameters must be accessible through this interface. 7. Manual mode of operation for pump for testing, manual flushing and manually-triggered priming operations. 8. Control panel to be U.L. listed. |
| — | — | <p>9.15 Fertigation Tank:</p> <p>Fertigation tank shall be supplied by the pump station manufacturer and installed separate from the pump station skid. Tank shall be vertically oriented, rotationally-molded, one-piece seamless construction, made of high density crosslinked polyethylene. The top and bottom heads shall be integrally molded with the cylindrical wall. Tank shall be capable of being completely gravity drained via an integrally molded flanged outlet. Tank shall be manufactured from materials certified to NSF/ANSI Standard 61 for chemical storage. Tank shall have a working capacity of 900 gallons and a nominal diameter of 5.33 feet.</p> <p>The supplied tank shall include the following:</p> <ol style="list-style-type: none"> 1. A bolted sealed top entrance manway with a minimum diameter of 19 inches 2. Exterior ladder constructed of fiber reinforced plastic, aluminum or stainless steel 3. 2 inch flanged integrally molded bottom outlet 4. Seismic restraint system sufficient to satisfy the requirements of the latest UBC and seismic zone 4 5. Adequate ventilation to protect tank integrity |

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| | | <p>6. HDPE base specifically designed to raise the tank approximately 4 inches and conform to the requirements of the seismic restraint system</p> <p>7. All necessary fittings to plumb the tank to the pump</p> <p>Tank shop drawings shall include sufficient data to show that the product conforms to the specification requirements and shall include calculations, dimensioned tank drawings and details of openings, fittings, accessories and seismic restraint system. Tank calculations shall be stamped and signed by an engineer registered in California and shall include but not be limited to calculations for wall thickness, hoop stress and seismic restraint system.</p> <p>Tank shall be a vertical IMFO, model 1100905, HDXLPE, with a nominal capacity of 905 gallons and a nominal diameter of 5.33 feet with matching IMFO pad as manufactured by Poly Processing Company or approved equal.</p> |
| — | — | <p>9.20 Disk Filter:</p> <p>General Description: The pump station manufacturer shall supply an automatic backwashing disk filter capable of filtering flows from 0 to 1500 gpm with a particle removal rating of 115 micron. The disk filter shall be an automatic self-cleaning filter using disc technology to achieve high filtration efficiency. The filter shall arrive completely assembled on the pump station skid. The filter shall be supplied with a screen rated for 140 mesh (115 micron) particle removal.</p> <p>The model shall be a Galaxy Disc-Kleen 26MSKPPT140AC-HP, 6-unit, 140 mesh, T configuration, AC model with 24 volt AC solenoids and a matching backwash controller with controls integrated to the pump station main controller as manufactured by NETAFIM or an approved equal. The filter shall have six (6) filter bodies, each with five (5) filter elements. The unit shall be rated for 140 psi operating pressure.</p> <p>Construction: The disk filter shall have inlet and outlet manifolds with flanged connection ends. The manifolds, Filter Body, and Filter Cover shall all be made from high density polypropylene. The filter element shall be made of stacked polypropylene discs. The discs will have grooves on both sides so that the grooves of one disc and the grooves of the disc immediately below it will cross at an angle of about 45 degrees. The 4 inch backflush valves are made of reinforced polyamide. Each backflush valve shall have a normally closed solenoid and plastic accelerator relay installed to its bonnet.</p> <p>Operation: The filter shall be capable of filtering suspended particles from water. The maximum operating pressure of the filter shall be 140 psi. The minimum pressure required for backflush shall be 40 psi during backflush. The minimum flow required for flushing is 175 gpm.</p> <p>The filter shall clean itself automatically when a pressure differential (PD) gauge triggers a backflush controller to initiate a backflush. The optimum setting for the PD gauge is 7 psi. The backflush controller will transmit an electric pulse to the 24-volt solenoid that will command the backflush valves to change from filtration mode to backflush mode. During backflush, the disks shall separate and clean filtered water will spray towards the disks from 3 banks of nozzles that are located on a spine component inside of the disks. The flushing time shall be 20 seconds. During flush, filtered water will continue to be supplied downstream of the filter. The filters will flush one at a time sequentially.</p> <p>The drain manifold and drain piping that directs the dirty flush water to the building drain will be completed by others.</p> |

SPECIAL PROVISIONS

Early Delivery Incentive: The City shall pay the successful bidder five hundred dollars (\$500) for every calendar day the complete irrigation pump station package is delivered prior to the required delivery date of 60 calendar days after receipt of purchase order, to a maximum of five thousand dollars (\$5,000)

Late Delivery Disincentive: The City shall deduct from the successful bidder five hundred dollars (\$500) for every calendar day the complete irrigation pump station package is delivered after the required delivery date of 60 calendar days after receipt of purchase order, in addition to the below Liquidated Damages.

Liquidated Damages: The successful bidder shall pay, as herein provided, to the City of Santa Rosa, the sum of fifteen hundred dollars (\$1,500.00) per day liquidated damages for each and every day's delay over and above the number of calendar days prescribed for finishing the work, in addition to the above Late Delivery Disincentive.

Insurance Requirements: The successful bidder shall, at all times while performing against the terms of the purchase order, maintain and keep in full force and effect, the following policies of insurance with minimum limits as indicated below and issued by insurers with AM Best ratings of no less than A-:VI or otherwise acceptable to the City.

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| A | Commercial general liability at least as broad as ISO CG 0001 | (per occurrence) | <u>\$2,000,000</u> |
| | With an edition date prior to 2004 or its equivalent ¹ | (aggregate) | <u>\$2,000,000</u> |
| B | Business auto coverage at least as broad as ICO CA 0001 ² | (per accident) | \$1,000,000 |
| C | Workers Compensation | | Statutory |
| | Employer's Liability | | \$1,000,000 |

¹ If insurance applies separately to this project/location, aggregate may be equal to per occurrence amount. Limits may be met by a combination of primary and excess insurance but excess shall provide coverage at least as broad as specified for underlying coverage.

² Auto liability insurance shall cover owned, non-owned and hired autos. If Contractor owns no vehicles, auto liability coverage may be provided by means of a non-owned and hired auto endorsement to the general liability policy. If Contractor will use personal autos in any way on this project, Contractor shall provide evidence of personal auto liability coverage.

³ Sole Proprietors must provide representation of their exempt status

Endorsements:

All policies shall contain or be endorsed to contain the following provisions:

Coverage shall not be canceled by either party, except after thirty (30) days prior written notice has been provided to the entity unless canceled for non-payment, and then ten (10) days notice shall be given.

Commercial General Policies are to contain, or be endorsed to contain the following provisions:

For any claims related to this project, the **Contractor's insurance coverage shall be primary** and any insurance or self-insurance maintained by the CITY shall be excess of the Contractor's insurance and shall not contribute with it.

The City of Santa Rosa, its officers, officials, employees and volunteers are to be named as **additional insured** on a form equivalent to CG20 10 with an edition date prior to 2004.

Other Insurance Provisions

No policy required by this section shall prohibit Contractor from waiving any right of recovery prior to loss. Contractor hereby waives such right with regard to the indemnitees.

All insurance coverage and limits provided by Contractor and available or applicable to this agreement are intended to apply to the full extent of the policies. Nothing contained in this Agreement limits the application of such insurance coverage.

Self-insured retentions and/or deductibles above \$5,000 must be approved by the CITY. At the CITY's option, the Contractor may be required to provide financial guarantees.

Verification of Coverage and Certificates of Insurance

Contractor shall furnish the CITY with original certificates and endorsements effecting coverage required above. Certificates and endorsements shall make reference to policy numbers. All certificates and endorsements are to be received and approved by the CITY before work commences and must be in effect for the duration of the contract. The CITY reserves the right to require complete, certified copies of all required policies and endorsements.

GENERAL PROVISIONS

Bids: Discounts for prompt payment must be shown on bid, otherwise prices will be considered net. Prompt payment discounts of less than 20 days following final acceptance of the equipment/materials by the City will not be factored into the evaluation of bids. Unless prices and all information requested are complete, bid may be disregarded and given no consideration.

This Invitation For Bids shall result in a firm, fixed price contract to purchase.

In case of default by the vendor, the City of Santa Rosa may procure the articles or services from other sources and may deduct from any monies due, or that may thereafter become due to the vendor, the difference between the price named in the contract or purchase order and actual cost thereof to the City of Santa Rosa. Prices paid by the City shall be considered the prevailing market price at the time such purchase is made. Periods of performance may be extended if the facts as to the cause of delay justify such extension in the opinion of the Purchasing Agent.

All prices and bids must be in ink or typewritten. No pencil figures or erasures are permitted. Mistakes may be crossed out and corrections inserted adjacent thereto and must be initialed in ink by person signing the bid. All bids must be signed with the firm's name and by a responsible officer or employee. Obligations assumed by such signature must be fulfilled.

Submission of Bids: Each bid must be submitted on the prescribed form in a sealed envelope with a bid number, closing date and time on the outside. Each bid must be signed as indicated above.

Information must be furnished complete in compliance with the terms, conditions, provisions and specifications of the Invitation For Bids. The information requested and the manner of submission are essential to permit prompt evaluation of all bids on a fair and uniform basis. Accordingly, the City reserves the right to declare as non-responsive, and reject any bid in which material information requested is not furnished or where indirect or incomplete answers or information is provided.

Bids shall be for the total net price including all applicable taxes and charges, delivered F.O.B., City of Santa Rosa.

Bids and modifications or corrections thereof received after the closing time specified will not be considered.

No telegraphic, telephone or facsimile of bids will be accepted. If a photocopy is to be submitted, it must be signed in original, in ink.

If you do not bid, return this Invitation For Bids and state reason; otherwise your name may be removed from our mailing list.

Local Vendor Preference: A one percent (1%) preference shall be granted to local bidders. A local bidder is defined as a business entity with its principal place of business located within the city limits of the City of Santa Rosa. To qualify for the preference, local bidders must submit proof of the address of its principal place of business and a copy of their current City Business Tax Certificate. Proof of address is normally the address to which Purchase Orders or contracts and payments will be sent. Copies of current City Business Tax Certificate must be submitted

with each bid for which a preference is claimed. The total amount of preference granted in a single bid shall not exceed \$5,000.00. Local preference only applies to the procurement of material, supplies, equipment, or services, and will not apply to bids conducted cooperatively with other public agencies nor when prohibited by the terms of a Federal, State or private grant of funds.

All or Nothing Bids: If your bid is on an "all or nothing" basis, so state as indicated in the Schedule beginning on Page 1 of this Invitation For Bids. If a seller elects to bid "all or none" as a part of his bid, the City will be bound by that condition and will not accept bids on individual items or group items for that bid. If the City awards to an "all or nothing" seller, that award shall be for the proposal as a whole or no part thereof.

Other Agency "Piggy-Back" Procurements: Other municipalities, fire districts or public agencies in Sonoma County may be interested in purchasing equipment as procured through this solicitation. The seller is to indicate in the Schedule beginning on Page 5 of this Invitation For Bids if pricing offered in this bid will be extended to other public agencies in this area not later than ninety (90) days after award by the City of Santa Rosa. Any such "piggy-back" awards will be made independently by each agency, and the City of Santa Rosa is not an agent, partner or representative of these agencies and is not obligated or liable for any action of debts that may arise out of such independently negotiated "piggy-back" procurements.

Delivery Charges: Delivery charges to the City of Santa Rosa shall be listed as a separate line item where indicated in the Schedule beginning on Page 1 of this Invitation For Bids.

Delivery: The delivery date or term within which the proposed item(s) will be delivered shall be stated in the space provided under Delivery Information. Failure by the successful seller to notify the City of Santa Rosa immediately of any delivery beyond the stated date or terms is cause for him to be held responsible for damages incurred as a result of an extended delivery time.

All equipment/material, spare parts and supplies shall be delivered F.O.B. destination, delivery charges prepaid and added, to the following location, unless otherwise indicated on the first page of the Invitation For Bids:

**City of Santa Rosa
Municipal Services Center North
55 Stony Point Road
Santa Rosa, CA 95401**

Warranty: The seller shall state on the Required Data Section the terms and conditions of the warranty being offered with the equipment bid.

It is understood by the sellers, and a condition of these specifications to which all sellers agree, that the City will not issue complete acceptance until the above warranty is furnished to the City by means of filing with the City Purchasing Agent.

In all purchases by the City of Santa Rosa, availability and accessibility of warranty service, and service after warranty may be considered in determining the low seller. ***[NOTE: Refer to Special Provisions Section and/or Minimum Specifications for any additional terms and conditions.]***

Material and Equipment Specified by Name: Whenever any material or equipment is specified by patent or proprietary name or by the name of the manufacturer, unless stated differently, such specification shall be considered as if followed by the words "or acceptable equal", whether or not such words appear. The seller may offer material or equipment with equal or better qualities and performance in substitution for those specified which he considers would be in the City's interest to accept. No verbal offers for substitution will be acknowledged or considered from sellers, distributors, manufacturers or subcontractors. Any such offers shall be made in writing to the Purchasing Agent for his consideration with the submission of the proposal and the seller shall include sufficient data which, together with any other data the City may require, will enable the City to assess the acceptability of the material or equipment. Such acceptance by the City shall not relieve the seller from full responsibility from the efficiency and quality and performance of the substitute material or equipment, in the same manner and degree as the material and equipment specified by name.

It should be understood that specifying a brand name, components and/or equipment in these specifications shall not relieve the seller from full responsibility to produce the products in accordance with the performance warranty and contractual requirements. The seller is responsible for notifying the City of any inappropriate brand name, component and/or equipment that may be called for in the specifications, and to propose a suitable substitute for consideration.

Materials and Workmanship: Materials used shall be of new and recent manufacture and best quality.

Bid Postponement and Amendment: The City of Santa Rosa reserves the right to revise or amend the specifications up to the time set for opening the bids. Such revisions and amendments, if any, shall be announced by amendments to this solicitation. Copies of such amendments shall be furnished to all prospective sellers. Prospective sellers are defined as those sellers listed on the City's Invitation For Bids list for this material, or who have obtained bid documents subsequent to the bid advertisement. If the revisions and amendments require changes in quantities or prices proposed, or both, the date set for opening bids may be postponed by such number of days as in the opinion of the City shall enable sellers to revise their bids. In any case, the bid opening shall be at least five (5) working days after the last amendment, and the amendment shall include an announcement of the new date, if applicable, for the opening of bids.

Single Bid Response: If only one bid is received in response to the Invitation For Bids, a detailed cost proposal may be requested of the single Seller. A cost/price analysis and evaluation and/or audit may be performed of the cost proposal in order to determine if the price is fair and reasonable.

Bid Withdrawal: After the bids are opened, bids may not be withdrawn for ninety (90) calendar days. Prior to the date/time set for the bid opening, however, bids may be modified or withdrawn by the Seller's authorized representative in person, or by written telegraphic notice. If bids are modified or withdrawn in person, the authorized representative shall make his identity known and shall sign a receipt for the bid. Written or telegraphic notices shall be received in the office designated on Page No. 1 of this Invitation For Bids no later than the exact date/time for the bid opening. A telegraphic modification or withdrawal received in the designated office by telephone from the receiving telegraph office no later than the date/time set for the bid opening shall be considered if such message is confirmed by a copy of the telegram.

Award: The City of Santa Rosa reserves the right to accept bids, award bids and/or not award bids on individual items listed, on group items, or on the proposal as a whole; to reject any and all bids, to waive any informality in the bids, and to accept the bid that appears from all consideration to be for the best interest of the City of Santa Rosa.

In determining and evaluating the best bid, the prices will not necessarily be controlling, but quality, equality, efficiency, utility, general terms, delivery, suitability of the equipment/material offered, and the reputation of the equipment/material in general use will also be considered with any other relevant factors. The Purchasing Agent shall be the sole judge in the determination of these matters.

Notice of bid award, if bid be awarded, will be made within ninety (90) days of opening of bids to the lowest responsive and responsible seller, whose bid proposal complies with all the requirements in the Invitation For Bids. Receipt of the official Purchase Order of the City of Santa Rosa covering the supplies, materials, equipment or services as described in the Bid will indicate the award of the bid and a contract to purchase.

Order Acknowledgment: The successful seller, after receipt of a City of Santa Rosa Purchase Order, shall be required to furnish the City Purchasing Agent, when made available, a copy of the factory order acknowledgment or production date(s) for the equipment/material ordered.

Contract Administration: Except as otherwise specifically provided in this Invitation For Bids, and the resulting Purchase Contract or Purchase Order, any notice, submittal or communication required or permitted to be served on a party hereto, may be served by personal delivery to the person or the office of the person identified. Service may also be made by mail, by placing a notice, submittal or communication in an envelope with the proper first-class postage affixed thereto and addressed as indicated, and depositing said envelope in the United States mail (see Required Data Section).

Option to Increase Quantity of Ordered Units: The City reserves the right to increase the quantity of ordered units shown on this Invitation For Bids by issuance on the original purchase order or an additional purchase order not later than ninety (90) days after award of bid. The successful seller agrees to furnish to the City the additional ordered units at the unit price offered in this Bid.

Modification: The City of Santa Rosa, at any time prior to the delivery date specified on the resulting Purchase Order or Purchase Contract, may issue a written order for any modifications. Such modifications shall be the result of negotiation and agreement between both parties.

Oral change orders are not permitted. No change in this Invitation For Bids or resulting Purchase Order or Purchase Contract shall be made unless the City of Santa Rosa gives its prior written approval from the office of the Purchasing Agent. The Seller shall be liable for all costs resulting from any unauthorized changes to the Invitation For Bids, Purchase Order or Purchase Contract.

Termination of Contract to Purchase: If at any time, in the opinion of the City, upon recommendation of the Purchasing Agent, 1) seller fails to conform to the requirements of this contract; or 2) seller seeks relief under any law for the benefit of insolvents or is adjudicated bankrupt; 3) any legal proceedings are commenced against seller which may interfere with the performance of the contract; or 4) seller has failed to supply an adequate working force, or material of proper quality, or has failed in any other respect to prosecute the work with the diligence and force specified and intended in any by the terms of the contract, notice thereof in writing may be served upon him, and should he neglect or refuse to provide means for a

satisfactory compliance with the contract as directed by the Purchasing Agent within the time specified in such notice the City in any such case shall have the right and power, at its option and without prejudice to any other right it may have, to terminate the contract. Any excess of the cost arising there from will be charged against the seller and his sureties, who will be liable thereof. In the event of such termination, all monies due the seller or retained under terms of the contract shall be forfeited to the City; but such forfeiture will not release the seller or his sureties from liability for failure to fulfill the contract.

Inspection: The City reserves the right and shall be at liberty to inspect all materials and workmanship and shall have the right to reject all materials and workmanship which do not conform with the equipment/material specification provided; however, the City is under no duty to make such inspection. Should it be determined, after inspection that a conditional acceptance exists and corrections are needed to bring the equipment/material up to the specifications of the bid award, the City, for the purpose of earning the discount, may extend the date of complete acceptance beyond the date of delivery.

Title: Title to the equipment/material shall pass to the City at the F.O.B. point designated under Delivery, subject to the right of the City to reject upon inspection.

Acceptance and Payment: Acceptance shall be made at the time all equipment/material is operational and in proper working order as determined by and to the satisfaction of the City of Santa Rosa. Acceptance of the equipment/material shall be determined on the basis of technical completeness, performance and adherence to the operational requirements and functions of the specifications.

Payment will be scheduled within thirty (30) days upon complete delivery and acceptance of all material/equipment and receipt of an original and one (1) copy of an invoice complying with the terms and conditions of the award. The City reserves the right to withhold up to ten percent (10%) of the purchase price in the event there is a conditional acceptance.

In connection with any discount for prompt payment specified on this Invitation For Bid, time will be computed from the date of complete acceptance of the equipment/material, or from date correct invoices are received in the City Finance Office, if the latter date is later than the date of complete acceptance. For the purpose of earning the discount, payment is deemed to be made on the date of mailing of the City warrant or check.

Non-compliance with any one of the following requirements shall constitute a conditional acceptance:

1. Adherence to the general construction and performance specifications.
2. Reasonable opportunity for equipment/material inspection by City Purchasing Department.
3. Receipt of manuals (if applicable).
4. Receipt of warranty statement.

Assignment and Subcontracting: The seller shall not assign or subcontract the work, or any part thereof, without the previous written consent of the City, nor shall he assign, by power of attorney or otherwise, any of the money payable under this contract unless written consent of the City has been obtained. No right under this contract, not claim for money due or to become due hereunder shall be asserted against the City, or persons acting for the City, by reason of any so-called assignment of this contract or any part thereof, unless such assignment has been authorized by the written consent of the City. In case the seller is permitted to assign monies due or to become due under this contract, the instrument of assignment shall contain a clause subordinating the claim of the assignee to all prior liens for services rendered or materials supplied for the performance of work.

Should any subcontractor fail to perform in a satisfactory manner the work undertaken by him, his subcontract shall be immediately terminated by the seller upon notice from the City. The seller shall be fully responsible and accountable to the City for the acts and omissions of his subcontractors, and of persons directly or indirectly employed by them, as he is for the acts and omissions of persons directly employed by him. Nothing contained in this contract shall create any contractual relation between any subcontract and the City.

Indemnify and Hold Harmless Agreement: Seller agrees to accept responsibility for loss or damage to any person or entity, and to defend, indemnify, hold harmless and release the City, its officers, and employees, from actions, claims, damages, disabilities or the cost of litigation that are asserted by any person or entity to the extent arising out of the negligent acts or omissions or willful misconduct in the performance by the seller hereunder, whether or not there is concurrent negligence on the part of the City, but excluding liability due to the active negligence or willful misconduct of the City. This indemnification obligation is not limited in any way by any limitation on the amount or type of damages or compensation payable to or for seller or its agents, under workers' compensation acts, disability benefits acts or other employees' benefits acts.

Seller shall be liable to City for any loss of or damage to City property arising from seller's negligence or willful misconduct.

Patents and Royalties: All costs involved in fees, royalties or claims for any patented invention, article, process or method that may be used upon or in any manner connected with the supply of this material shall be paid by the seller. Should the seller, his agent or employees or any of them be enjoined from furnishing or using any invention, article, material or plans supplied or required to be supplied or used under the contract, the seller shall promptly substitute other articles, materials or appliances in lieu thereof equal finish, efficiency, quality, suitability and market value, and satisfactory in all respects to the City. Or in the event that the City elects, in lieu of such substitution, to have supplied and to retain and use any such inventions, articles, materials or plans as may be required to be supplied the seller shall pay such royalties and secure such valid licenses as may be requisite for the City, its officers, agents, and employees, or any of them to use such invention, article, materials or appliances without being disturbed or in any way interfered with by any proceeding in the law or equity on account thereof. Should the seller neglect or refuse to make the substitution promptly or to pay such royalties and secure such licenses as may be necessary, then in the event the City shall have the right to make such substitution or the City may pay such royalties and secure such licenses and charge the seller even though final payment under the contract may have been made.

Federal and State Tax: Prices quoted shall not include Federal Excise Tax. California Sales Tax of eight percent (8%) will be paid in accordance with the contract payment schedule.

Legality: If any provisions of this Invitation For Bids shall be held to be invalid, illegal or unenforceable, the validity, legality and enforceability of the remaining provisions shall not in any way be affected or impaired thereby.

California Law: This Invitation For Bids shall be governed according to the laws of the State of California.

Compliance with Laws and Regulations: All materials, parts and equipment furnished pursuant to these specifications shall be in compliance with the laws and regulations of the State of California and OSHA. The seller shall, if requested by the City, supply certification and evidence of such compliance.

Retention of Records: The seller shall be required to retain any records necessary to document the charges for goods to be provided or services to be performed and make such records available to the City for inspection at the City's request for a period of four (4) years.

Recycled Content, Recyclability:

- A. **Recycled Content Preference:** It is the City policy, whenever practicable, to purchase functional products which contain, in order of preference:
1. the highest percentage of post-consumer recovered material available in the marketplace; and
 2. the highest percentage of secondary waste recovered material available in the market place.
- B. **Recyclability and Waste Reduction:** In addition to the recovered material content of a product, important criteria in selecting products shall also be:
1. the ability of the product and its packaging to be reused, reconditioned for use, or recycled through existing recycling collection programs; and
 2. the volume and toxicity of waste and by-product a given product and its packaging generate in their manufacture, use, recycling, and disposal. Products and packaging designed to minimize waste and toxic by-products in their manufacture, use, recycling, and disposal shall be preferred.
- C. **Equipment Compatibility:** Equipment purchased or rented by the City shall be compatible, whenever practicable, with the use of recycled-content products.
- D. **Definitions:** For the purposes of this general provision, a "recycled product" means all materials, goods, and supplies, no less than 50% of the total weight of which consists of secondary and post-consumer waste with not less than 10% of its total weight consisting of weight consisting of post-consumer waste. "Post-consumer waste" means a finished material which would normally be disposed of as solid waste, having completed its life cycle as a consumer item, and does not include manufacturing waste. "Secondary waste" means fragments of products or finished products of a manufacturing process which has converted a virgin resource into a commodity of real economic value, and includes post-consumer waste, but does not include excess virgin resources of the manufacturing process. **[Source: California Public Contract Code, Section 12200]**

Bid Contents: This proposal consists of the Invitation For Bids, Bid, Provisions, Specifications, Attachments and other terms and conditions as are attached or incorporated by reference in the schedule of the Invitation For Bids.

REQUIRED DATA FORMS

List of Forms:

Exceptions to Specifications

Recycled Data

Warranty Information

Designated Contact

[illegible]

REQUIRED DATA**Recycled Content**
(If Applicable)

All bidders are required to disclose the minimum, if not exact, percentage of recycled product, both secondary and post-consumer, contained in each offered product.

NOTE: See “*Recycled Content, Recyclability*” in the *General Provisions* for definitions.

| Bid Item No. | Minimum or Exact Post-Consumer Waste Content | Minimum or Exact Secondary Waste Content |
|--------------|--|--|
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✓ _____ Attach additional sheets as necessary, and place a check mark at the space provided at left.

Failure to provide accurate information may result in your bid being considered non-responsive. Deliberately providing false information may result in you and your firm being barred from doing business with the City of Santa Rosa for a period of up to three (3) years.

Signature of Person Authorized to Sign

Name: _____

Title: _____

REQUIRED DATA**Warranty Service**

The Irrigation pump station package bid shall be covered by the warranty as described under Specification Part 9 – Warranty and shall be confirmed by the bidder in the below spaces. Bidders shall also provide in the below spaces the name and address of the warranty service locations during the warranty period and after the warranty period. ***NOTE: In all purchases made by the City, availability and accessibility of warranty service and service after warranty may be considered in determining the lowest responsive and responsible bidder.***

Warranty Terms and Conditions

Warranty Service Location

Name: _____
Address: _____

Phone: _____
Fax: _____

Service Location after warranty

Name: _____
Address: _____

Phone: _____
Fax: _____

REQUIRED DATA**Designated Contact**

Indicate in the space provided below, the designated contact individuals name and address as requested under Notification in the General Provisions Section of the Invitation For Bid.

| <u>CITY OF SANTA ROSA</u> | <u>VENDOR</u> |
|---|----------------------|
| Jim Wright | _____ |
| Purchasing Agent | _____ |
| 630 Third Street, 2 nd Floor | _____ |
| Santa Rosa, CA 95404 | _____ |
| (707) 543-3706 Voice | _____ |
| (707) 543-3624 Fax | _____ |